

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of : **Confirmation No. 4771**
Mieko SAKAI et al. : Attorney Docket No. 2005_0903A
Serial No. 10/537,548 : Group Art Unit 3752
Filed June 3, 2005 : Examiner Dinh Q. Nguyen
HIGH PRESSURE WATER JET SURFACE : **Mail Stop: AF**
CUTTING DEVICE AND CUTTING
METHOD

REQUEST FOR RECONSIDERATION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This request for reconsideration is submitted without an extension of time being necessary. The final Office Action dated July 15, 2008 set no statutory period for response. Accordingly, according to the terms of the Office Action Summary, form PTOL-326, the period for reply is six months from the mailing date of the communication, i.e. October 15, 2008. Thus, no extension at this time is necessary.

In view of the discussion as set forth below, reconsideration of the rejections that are contained in the Office Action of April 15, 2008 is respectfully requested.

Claims 21-40 are not Indefinite

Initially, in section 1 on page 2 of the Office Action, the Examiner purported to reject claims 21-40 as being indefinite. However, the objectionable matter to which the Examiner points is contained in claim 23. Claim 23 depends from claim 22, which itself depends from claim 21. Thus, the reason the Examiner sets forth that is contained in claim 23 is clearly not applicable to claims 21 and 22, nor any other claims not dependent from claim 23. Similar type

of language is included in claim 32, dependent from independent method claim 30 through claim 31.

However, the language of claims 23 and 32 is definite. These claims recite that the plurality of high pressure water jet nozzles arranged on the nozzle head include high pressure water jet centers being inclined in a direction away from the axis of rotation and high pressure water jet centers being inclined toward the axis of rotation. The Examiner considers this language to be internally inconsistent. However, it is not inconsistent, and it clearly reflects what is set forth in the specification.

Noting for example page 7 of the original specification, in the third paragraph, the plurality of high pressure water jet nozzles 3 include high pressure water jet centers 3AC inclined in a direction away from the axis of rotation and high pressure water centers 3BC inclined in a direction toward the axis of rotation. Obviously these are not the same high pressure water jet centers of the respective nozzles.

The language in claims 23 and 32 is that the plurality of high pressure water jet nozzles arranged on the nozzle head include high pressure water jet centers being inclined in a direction away from the axis of rotation and high pressure water jet centers being inclined toward the axis of rotation. As can be seen from the above description, this is clearly the case; the specification discloses high pressure water jet centers that are inclined away from the axis of rotation, and high pressure water jet centers that are inclined toward the axis of rotation. Both are present. The claim language does not require the high pressure water jet centers that are inclined away from the axis of rotation to be the same high pressure water jet centers that are inclined toward the axis of rotation. No such limitation is present in the claim. Thus the claim language is simply reflective of what is described in the specification and illustrated in Fig. 3, for example. The language is clearly definite and, in the context of the specification, clearly understood.

Accordingly, because the Examiner's rejection encompasses claims that do not contain the objectionable subject matter, and because the subject matter objected to by the Examiner is not in fact indefinite, withdrawal of this rejection is respectfully requested.

The Examiner's Rejection of Claims 21-40 Over Prior Art Should be Withdrawn as the Prior Art is not of Record in the Application

The Examiner rejected claims 21-40 as being unpatentable over Rogers et al. in view of Pekarek. As was later noted by the Examiner, this is a reference to U.S. Patents 6,648,242 and 3,414,070. However, the patents have not been made of record in the application. Accordingly, it is respectfully submitted that the final rejection should be withdrawn and a new Office Action should be issued making the prior art that is cited by the Examiner of record in the application.

In any Case, Claims 21-40 Clearly Distinguish Over Rogers and Pekarek

As was previously discussed, the present invention is directed to a method and device for cutting the resin matrix portion on a surface of a composite molded article that has an irregular surface having a height from a foundation layer surface within a range of 1 to 100 mm, the resin matrix portion including inorganic particles and a resin. Fig. 1 of the application shows such a surface, which can include surface features, designs, decorations, etc. The present invention provides a high pressure water jet surface cutting device that enables the cutting of the resin matrix portion on the surface of a composite molded article. This includes a high pressure water jet nozzle head that is movable in X and Y directions while being rotated about an axis of rotation.

A plurality of high pressure water jet nozzles are arranged in the nozzle head so that the high pressure water jet centers of the nozzles are directed at inclined angles with respect to the axis of rotation so that the jet centers of the nozzles will be directed at the inclined angles with respect to the foundation layer surface of the composite molded article when cutting the resin matrix portion. The nozzles are positioned on the nozzle head so that cutting of the resin matrix portion by jetting high pressure water from the nozzles while moving the high pressure water jet nozzle head in the X and Y directions and rotating the high pressure water jet nozzle head about the axis of rotation results in areas that are formed by low side of the jet centers with respect to the foundation layer surface against which the high pressure water is jetted and strikes is uniform.

This combination of features is not made by obvious by looking at Rogers and Pekarek, even if they are considered together.

The patent to Rogers is directed to a mechanism that removes paint, coatings or oxides or which can otherwise be used to change the mechanical characteristics of a surface. Rogers employs a single fluid jet that provides a shaking motion to the nozzle rather than a rotational motion.

That is, as can be seen in Fig. 2, nozzle 80 is attached to the end of a fixed tube 14. As described in the second complete paragraph of column 4 of Rogers, tube 14 is a non-rotating tube that does not rotate about its axis. Rather, it revolves around an axis due to an eccentric mechanism, but it is itself kept non-rotational.

Thus, Rogers does not disclose a high pressure water jet nozzle head that is movable in X and Y directions while being rotated about an axis of rotation as claimed.

The cited patent to Pekarek, however, is in a completely different art. Pekarek discloses a drilling bit for drilling wells. While Pekarek uses high-velocity jets of abrasive-laden slurries, it is disclosed for hydraulic jet drilling for drilling deep wells in hard formations. Thus the drill bit of Pekarek moves in the Z direction to drill a hole and it may rotate, but it is not clear that there is movement in the X or Y directions.

The structure and operation of Pekarek is distinctly different from that of Rogers. The two are for completely different purposes: Rogers is disclosed for removing coatings or providing a surface effect. Pekarek is drilling a hole, and, indeed, is intended for drilling deep wells. This is a very distinct field of operation than Rogers. These references are not analogous prior art. The types of problems that are run across in drilling a deep hole, which can be clearly seen from the discussion of Pekarek, are completely distinct from the issues that are raised when removing a material from a surface of a composite molded article is claimed. One of ordinary skill in the art would not have been motivated, i.e. would have had no reason, to combine Pekarek with Rogers. There is nothing in either reference that would give one of ordinary skill in the art any reason to try to combine the two in any meaningful manner. There is nothing to suggest that the nozzle arrangement of Pekarek would have any utility in Rogers.

Look at the discussion in Pekarek, for example. In column 4, beginning at line 52, it is discussed that the four nozzles 48a are positioned with their faces close to the outside circumference at an angle of about 27° to the longitudinal axis of the bit in order to cut a groove on the borehole bottom that has a radius of about $1/4$ to $1/2$ inch larger than the bit. Nozzles 48b are positioned at a smaller angle on the order of 17° to cut a groove that is spaced inwardly of the groove but by the nozzles 48a. Nozzles 48c will cut a groove that is spaced inwardly of the groove cut by nozzles 48b and produce a ridge between them that is in the path of stand-off bars 34. None of these reasons for providing the angled nozzles of Pekarek have any relation to the surface effects that are described in Rogers. Thus, they provide no reason for one of ordinary skill in the art to modify Rogers with the arrangement of Pekarek.

It is additionally noted that Rogers generally discusses the device being used for cutting a surface portion of a coating, but does not refer to cutting a surface of a composite molded article that includes an irregular surface as in the present invention. The combination of the nozzle head with a plurality of high pressure water jet nozzles that are arranged as defined in claims 21 and 30, and the movement in the X-Y direction, i.e. the movement along the surface of the composite molded article, consisting of inorganic particles and a resin, imparts unexpected and excellent results for cutting of the surface and the composite molded article, as illustrated by the examples that are shown in the specification. A PMAA resin matrix surface layer at a thickness of $200\text{ }\mu\text{m}$ can be satisfactorily cut at all of its vertex portions, flat portions, and inclined portions of the irregularly shaped surface.

Even if a nozzle head, having as many nozzles as those according to the present invention, is employed and set so that a predetermined matrix surface layer can be cut along its flat portion, then the matrix surface layer along the inclined portion is hardly cut. If they are set so that the water jet pressure is higher and the distance between each nozzle and the molded article is shorter so that the inclined portion is cut to a predetermined cutting thickness, then the flat portion is excessively cut. This is discussed in the specification. These facts illustrate that the present invention imparts unexpected results over the prior art, including the two references that have now been cited by the Examiner.

In any case, it is respectfully submitted to be clear that the Examiner's combination of Pekarek and Rogers cannot be made. They are related to two completely different fields, and there is no logical reason why one of ordinary skill in the art would have attempted to combine the two. Certainly, there is nothing in either reference that provides a reason to make any such combination.

The Examiner's conclusion that Rogers and Pekarek are known work in one field of endeavor is traversed. Clearly they are not. The problems in the one field do not relate to the problems in the other field, and this is clear from the discussion in Pekarek, for example. The modification of Rogers with Pekarek, further, is not merely the use of a known technique to improve a similar device. Rather, the proposed modification of Rogers with Pekarek goes against the basic teachings and purposes of Rogers itself.

That is, Rogers is specifically requiring that the tube 14 be non-rotational but revolved due to the eccentric arrangement. This is completely counter to Pekarek, in which the drill bit was rotated about its axis. A meaningful combination of the two does not result from the actual discussions and facts that are set forth in the respective references. This is clearly indicative of hindsight reasoning by the Examiner.

The Examiner also states that the modification is "choosing from a finite number of predictable solutions." However, this conclusion by the Examiner begs the question of what problem the "predictable solution" is being applied to. Neither reference notes any problem looking for a solution, and thus there is no reason to combine the two. In addition, there is no evidence that there is a finite number of solutions to the "problem."

All of this is clearly indicative of the non-obviousness of the combination. Only Applicants have recognized the problem that is addressed in Applicants' specification, which is reflected in the independent claims as well. Only Applicants have arrived at the particular solution that is set forth in the claims. The references provide no reason, as required by KSR, cited by the Examiner, to make a combination of the two.

Accordingly, it is respectfully submitted that all of the claims pending in this application clearly patentably define over Rogers and Pekarek. Withdrawal of the combination of these two

references is thus respectfully requested. Indication of the allowability of all of the claims is further requested.

In view of the above remarks, it is submitted that the present application is now in condition for allowance, and the Examiner is requested to pass the case to issue. If the Examiner should have any comments or suggestions to help speed the prosecution of this application, the Examiner is requested to contact Applicants' undersigned representative.

Respectfully submitted,

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